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The writers wish to express their indebtedness to the National Academy of Sciences for a grant of two hundred dollars from the Wolcott Gibbs Fund, which has been used to purchase the apparatus for this work. The complete paper will be published in the *Journal of the American Chemical Society*.

¹ Werner and Herty, *Zs. physik. Chem.*, **38**, 331 (1901).

² Petersen, *Zs. physik. Chem.*, **22**, 410 (1897); **39**, 249 (1902).

³ Harkins, *J. Amer. Chem. Soc.*, **33**, 1807-73 (1911).

NATIONAL RESEARCH COUNCIL

REPORT OF THE FIRST MEETING OF THE COUNCIL

The first meeting of the Research Council was held in New York City on September 20, 1916.

Dr. M. I. Pupin, as Temporary Chairman, called the meeting to order at 3.10 p.m., and directed a roll-call of the members of the Council. There were present the following members: Messrs. Carty, Dunn, Goss, Hale, Herschel, Holmes, Keen, Manning, Marvin, Millikan, Noyes, Pickering, Pupin, Rand, Skinner, Squier, Stratton, Swasey and Vaughan.

The Temporary Chairman then called for nominations for Permanent Chairman. Dr. George E. Hale was nominated and unanimously elected. Dr. Hale then took the Chair and presided for the remainder of the meeting. Dr. Charles D. Walcott was elected First Vice-Chairman, and Mr. Gano Dunn, Second Vice-Chairman.

Dr. Hale, as Chairman of the Organizing Committee of the Council, announced an agreement between the National Academy of Sciences and the Engineering Foundation by which the Engineering Foundation has placed its funds at the disposal of the Council for a period of one year and has given the services of its Secretary, Dr. Cary T. Hutchinson, to the National Research Council, to serve as its Secretary. Dr. Hale announced that in accordance with this agreement the National Academy of Sciences has appointed Dr. Hutchinson Secretary of the National Research Council. Dr. Hutchinson was present and acted as Secretary to the meeting.

The Chairman then gave an extended account of the work done by the Organizing Committee during the summer months, dwelling particularly upon his trip to England and France, and upon the results that have been reached there by similar organizations of the men of science.

At the conclusion of the Chairman's remarks the organization of the Council was discussed; and the motion was made that an Executive Committee to consist of a chairman and nine members be appointed by the Chair, with the Chairman of the Council and President of the Academy as additional mem-

bers *ex officio*, this Committee to have full authority in the interim between meetings of the Council to carry out the purposes described in the Preliminary Report of the Organizing Committee (published in the August number of these PROCEEDINGS), it being understood that, in carrying out the general plan of work of the Council as there outlined, the Executive Committee shall not be limited to a narrow interpretation of the objects, but shall have full power to undertake similar or related work, even though not specifically included in that report. This motion was carried unanimously.

The Chairman then requested the members of the Council to express their views on the proposed work of the Council, and in particular to make suggestions covering definite lines of work that might fall within the sphere of activity of the Council.

Dr. Keen reported that upon notification of his selection to the Council he had made a careful investigation of the attitude of the colleges and medical schools in the vicinity of Philadelphia and that all approved the objects of the Research Council and would give their best support to it; also that the American Philosophical Society would co-operate with the Research Council in every particular. Professor Pickering dwelt on the opportunity for co-operation in astronomical work. Dr. Pupin spoke at length on the great value of co-operation in industrial research, as evidenced by the work of the Research Laboratory of the General Electric Company; he emphasized the difficulties in securing men adequately trained. Professor Conklin cited the results accomplished by co-operative effort in zoological work at the Woods Hole Biological Station, which he stated has passed resolutions endorsing the work of the Research Council and promising co-operation, as follows:

WHEREAS, the National Academy of Sciences at the request of President Wilson has taken the initiative in bringing into co-operation existing governmental, educational, industrial and other research organizations and has brought about the establishment of a National Research Council which shall be representative of these various organizations, and whose object shall be the promotion of scientific research with especial reference to national welfare; and

WHEREAS, the Marine Biological Laboratory is a striking illustration of the value of co-operation in the promotion of scientific research; and

WHEREAS, we believe that human progress depends upon increasing knowledge of nature and that national welfare can most effectively be advanced by the co-operation of scientific investigators;

Now, Therefore, be it resolved, that the Trustees of the Marine Biological Laboratory approve of the establishment of a National Research Council and agree to co-operate in all practicable ways in its work of co-ordinating and promoting scientific research.

Dr. Noyes called attention to the need of urging universities and colleges to interest more men in research work and to train them for it more effectively. Dr. Carty dwelt on the essential identity between pure and applied research, pointing out that they do not differ in kind but merely in the objects to be accomplished; that industrial research has as its objective commercial or industrial development, and that scientific research has no such immediate pur-

pose. Colonel Squier spoke at some length on his experience in England during the past four or five months in communication with the War Department; he dwelt on the vital importance of pure scientific research and predicted that the United States will probably find it desirable to appoint as a cabinet officer a Secretary of Sciences in the not distant future. Dr. Stratton emphasized the growing need of more and better training of men for research work. Dr. Goss deprecated the distinction between pure and applied science, claiming that such distinction did not in reality exist and that all was science. Dr. Vaughan believed that much good could be done by the Council in stimulating the Congress of the United States to make greater appropriations to help pure science, and instanced the mean support given by the Government in many cases. Mr. Manning dwelt briefly upon the work of the Bureau of Mines and outlined the assistance given to the Bureau of Mines by the great chemical and smelting companies; he suggested similar assistance in the development of pure scientific research.

Dr. Millikan then presented a preliminary report for the Committee on the Newlands' Bill, which provides for the appropriation by the Government of \$15,000 annually to each of the states, to be applied to research in engineering and applied science. After discussion the report was referred back to the Committee for further consideration with instructions that it be then referred to the Executive Committee of the Research Council.

A recess was then taken to enable the members of the Council to attend a dinner given in their honor at the University Club by Dr. George E. Hale.

The Council was called to order at 9.30 p.m. by the Chairman. The same members were present as at the afternoon meeting. Mr. Melville Stone, manager of the Associated Press, was also present as a guest of the Council.

At the invitation of the Chairman, the members discussed special features of the work that the Council might undertake.

Dr. Keen emphasized the necessity for making available the advances in surgery during the war. Dr. Vaughan emphasized the importance of this. Dr. Pupin spoke generally on the value of the proposed work of the Council. Dr. Holmes spoke of the possibilities of development in anthropological work and promised to present his views in writing later. Prof. Marvin believed it to be desirable to conduct a campaign of education to bring to congressmen a realization of the importance of scientific research.

Dr. Noyes made a general report on the work done by the Nitrate Supply Committee, of which he is the Chairman. He thought also that much good could be accomplished by encouraging the publication of a journal of popular science which should emphasize the relations of science, and especially of scientific research, to the public welfare, and that this might be done in co-operation with the American Association for the Advancement of Science.

Mr. Rand dwelt upon the essential need of co-operation with the great industrial research organizations, instanced the assistance that the Research Laboratories of the U. S. Steel Corporation had rendered to the Institute of

Mining Engineers, and expressed the belief that the co-operation of the U. S. Steel Corporation with the Research Council could readily be secured. Mr. Skinner outlined the work of the Westinghouse Research Laboratory and suggested specifically investigations on fuel for internal engines, on the prevention of corrosion, and on vocational diseases. Mr. Herschel pledged the support of the American Society of Civil Engineers, Dr. Goss dwelt on the necessity of co-operation in institutions of the Middle West, and suggested a committee on relations of the universities to the National Research Council.

Dr. Vaughan called attention to the need of proper means of publicity, and Mr. Melville Stone, the guest of the Council, made a forceful address on the relations of the Associated Press to men of science and pledged the firm support of his organization to the objects of the Research Council.

Mr. Dunn outlined in considerable detail the relations of the Engineering Foundation to the National Research Council and praised the generosity of Mr. Swasey in giving his liberal support to the Foundation. Mr. Swasey in reply minimized his own share in the development of the Foundation. He suggested that a committee on optical and commercial glass would find a large field for useful work.

The Chairman announced the appointment of the following six members of the Executive Committee: Messrs. J. J. Carty, E. G. Conklin, Gano Dunn, A. A. Noyes, M. I. Pupin and V. C. Vaughan. He stated that the other four members would be appointed after further consideration.

It was voted that the Council should meet at the call of the Executive Committee.

A vote of thanks to the Chairman for his invaluable services was unanimously adopted.

After further general discussion the meeting adjourned at 11.30 p.m.

CARY T. HUTCHINSON, *Secretary*.

REPORTS OF MEETINGS OF THE EXECUTIVE COMMITTEE

The first meeting of the Executive Committee was held in New York on September 21, 1916. There were present Messrs. J. J. Carty, E. G. Conklin, Gano Dunn, G. E. Hale, A. A. Noyes, Michael Pupin and V. C. Vaughan, and C. T. Hutchinson the Secretary of the Council.

Dr. J. J. Carty was elected Chairman; and Dr. C. T. Hutchinson, Secretary of the Committee.

It was voted that the terms of the present members of the Research Council and of the Executive Committee be deemed to expire on January 1, 1918.

The following resolution was adopted, expressing the general policy to be followed by the Council in the promotion of research.

Resolved, that the efforts of the Research Council shall be uniformly directed to the encouragement of individual initiative in research work, and that co-operation and organization,